

### **REMARKS**

Claims 1-8, 10-13, 16-24 and 26-41 are currently pending in the subject application, and are presently under consideration. Claims 16 and 24 are allowed. Claims 1-8, 10-13, 17-23 and 26-41 are rejected. Claims 13, 39 and 41 have been amended. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

#### **I. Amendments to the Specification**

The Specification of the present application has been amended to update the status of co-pending applications. No new matter has been added.

#### **II. Rejection of Claims 1-8, 10-14, 17-23, and 26-41 under 35 U.S.C. 103(a)**

Claims 1-8, 10-14, 17-23, and 26-41 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2002/0133674 to Martin, et al. (hereinafter, "Martin"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

In rejecting claim 1, the Office Action contends that a block request disclosed in Martin corresponds to an ownership update message, as recited in claim 1 (See Office Action, Page 3). In claim 1, the ownership update message is provided in response to a change in ownership state of a block of data. In Martin, before a processor reads or writes to a block of memory, that processor broadcasts a request for that block of memory to all other nodes in the disclosed system, and a node owning that block responds directly to the requesting node, forwarding the desired block of memory (See Martin, Par. [0005]). Applicant's representative respectfully submits that a request for a block of memory, as disclosed in Martin, does not indicate that a change in ownership state of the block of memory has occurred (or even will occur), in contrast to the ownership update message recited in claim 1. For instance, as is well known, some requests for memory can be refused, such as when a first processor requests read or write access to a block of memory that is held by a second processor in a modified (M) state (See e.g., <http://en.wikipedia.org/wiki/MESI#Operation>). In such an instance, the second processor would respond to the read or write request with a retry later (or a back off) message.

Stated differently, claim 1 recites a temporal relationship between the providing of the ownership update message and a change in ownership. That is, in claim 1, the ownership update

message is provided after a change in ownership state of the block of data, since claim 1 recites that the ownership update message is provided in response to a change in ownership state of the block of data. A block request, as disclosed in Martin, at best would only indicate a desire for the ownership state of the data to change at some point in the future. Martin expressly states the following:

In the snooping protocols, a given cache, before its processor reads or writes to a block of memory, "broadcasts" a request for that block of memory to all other "nodes" in the system. The nodes include all other caches and the shared memory itself. The node "owning" that block responds directly to the requesting node, forwarding the desired block of memory. Martin, Par. [0005].

Thus, Applicant's representative respectfully submits that in contrast to the contention of the Office Action, the block request disclosed in Martin does not correspond to the ownership update message recited in claim 1. Instead, the block request referred to in the Office Action (at page 3) is a broadcast request for a block of memory. After a careful review of Martin, Applicant's representative respectfully submits that no structure or function taught or suggested in Martin corresponds to the ownership update message recited in claim 1.

Moreover, in rejecting claim 1, the Office Action contends that a predictor 98 disclosed in Martin corresponds to the given owner predictor recited in claim 1 (See Office Action, Page 2). In claim 1, the given owner predictor (1) provides the ownership update message and (2) comprises a second component that stores ownership update messages provided from an owner predictor control. Applicant's representative submits that since Martin does not teach or suggest the ownership update message recited in claim 1, Martin also does not teach or suggest to one of ordinary skill in the art the given owner predictor recited in claim 1. This deficiency notwithstanding, Martin discloses that the predictor 98 predicts processing units that are likely to have a block of data 19 being sought (See Martin, Par. [0071]). In Martin, the predictions are made by storing information about (1) mispredictions of the same or spatially adjacent blocks of data 19, (2) mispredictions of the same static load or store instructions or (3) input from software (See Martin, Par. [0071]). However, nothing in Martin teaches or suggests to one of ordinary skill in the art that the disclosed predictor 98 (or any other disclosed function or structure) (1) provides an ownership update message and (2) comprises a second component that stores ownership update messages provided from the owner predictor control, as does the given

predictor recited in claim 1. Accordingly, Martin fails to teach or suggest to one of ordinary skill in the art how to implement the given owner predictor recited in claim 1. Furthermore, since the Office Action does not provide any other evidence sufficient to maintain a legal conclusion of obviousness with respect to claim 1, claim 1, as well as claims 2-8, 10-12 and 38-40 depending therefrom, are patentable.

Additionally, in rejecting claim 12, the Office Action contends that paragraph [0071] of Martin discloses the features recited in claim 12 (See Office Action, Pages 5-6). As noted with respect to claim 1, in Martin, a predictor 98 makes predictions by storing information about (1) mispredictions of the same or spatially adjacent blocks of data 19, (2) mispredictions of the same static load or store instructions or (3) input from software (See Martin, Par. [0071]). Nothing in the cited section of Martin, or Martin more generally, teaches or suggests to one of ordinary skill in the art that the predictor 98 selects between accessing a first component and a second component of an owner predictor according to a frequency in which ownership messages associated with a block of data have been received from an owner predictor control, as recited in claim 12. Accordingly, Martin does not teach or suggest to one of ordinary skill in the art how to implement the owner predictor recited in claim 12. Moreover, since the Office Action does not provide any other evidence sufficient to establish a legal conclusion of obviousness with respect to claim 12, claim 12 is patentable.

Claim 39 has been amended to clarify that an owner predictor control is configured to discontinue providing an ownership update message corresponding to a given block of data based on (i) and available bandwidth in a system and (ii) a frequency with which a given block of data changes ownership. The Office Action contends that paragraph [0002] of Martin discloses the features of claim 39. Paragraph [0002] of Martin discloses choosing a mechanism for communicating cache coherence messages based on the bandwidth available for transmitting such messages. In contrast, amended claim 39 recites that the ownership update messages are discontinued under expressly recited circumstances. As noted with respect to claim 1, from which amended claim 39 depends, Martin fails to teach or suggest any structure or function that corresponds to an ownership update message. These deficiencies notwithstanding, nothing in the cited section of Martin (or Martin more generally) teaches or suggests discontinuing providing of ownership update messages corresponding to a given block based on two criteria, namely (i) an

available bandwidth in the system and (ii) a frequency with which the given block of data changes ownership. Instead, the cited section of Martin merely discloses that a mechanism for communicating cache coherency messages is based on available bandwidth (See Martin, Par. [0002]). Thus, in addition to the aforementioned deficiencies of Martin, nothing in the cited section of Martin (or Martin more generally) teaches or suggests discontinuing the providing of ownership update messages based on the second recited criterion, namely a frequency with which a given block of data changes ownership. Accordingly, Martin does not teach or suggest to one of ordinary skill in the art how to implement the system recited in amended claim 39. Moreover, since the Office Action does not provide any other evidence sufficient to establish a *prima facie* case of obviousness with respect to claim 39, amended claim 39 is patentable.

Claim 13 has been amended to correct a typographical error. Applicant's representative respectfully submits that the Office Action has failed to establish a *prima facie* case of obviousness with respect to claim 13. In rejecting claim 13, the Office Action relies partially on the same rationale that was relied on in the rejection of claim 1. However, Applicant's representative respectfully submits that claim 13 has a different scope than claim 1. Thus, claim 13 warrants separate consideration for patentability. Specifically, claim 13 recites an owner predictor that broadcasts an update message to respective owner predictors associated with each of a plurality of processors comprising a multiprocessor network. The broadcasting to plural owner predictors recited in claim 13 is not recited in claim 1. Thus, the rationale provided for the rejection of claim 1 (particularly regarding the recited owner predictor control) is insufficient to establish a *prima facie* case of obviousness with respect to claim 13. Accordingly, claim 13, as well as claims 17-20 and 41 depending therefrom are patentable.

Additionally, claim 41 has been amended in a manner similar to claim 39. Accordingly, amended claim 41 is patentable for reasons similar to as explained with respect to amended claim 39.

Applicant's representative respectfully submits that the Office Action has failed to establish a *prima facie* case of obviousness with respect to claim 21. In rejecting claim 21, the Office Action relies on the same rationale that was relied on in the rejection of claims 1-3 (See Office Action, Page 7). However, Applicant's representative respectfully submits that claim 21 has a different scope than claims 1-3. Thus, claim 21 warrants separate consideration for

patentability. Specifically, claim 21 recites an update control that provides an ownership update message to an owner predictor associated with each of a plurality of processing nodes, which is not recited in claims 1-3. Accordingly, the rationale provided for the rejection of claim 1 (particularly regarding the recited owner predictor control) is insufficient to establish a *prima facie* case of obviousness with respect to claim 21. Therefore, claim 21, as well as claims 22-23 and 27-29 depending therefrom are patentable.

The Office Action has also failed to establish a *prima facie* case of obviousness with respect to claim 30. In rejecting claim 30, the Office Action relies on the same rationale that was relied on in the rejection of claims 3-4 (See Office Action, Page 8). However, Applicant's representative respectfully submits that claim 30 has a different scope than claims 3-4. Specifically, claim 30 recites means for broadcasting updates to all means for identifying in response to a change in ownership of a block of data, which means for broadcasting is not recited in claims 3-4. Thus, the rationale provided for the rejections of claim 3-4 is insufficient to establish a *prima facie* case of obviousness with respect to claim 30. Accordingly, claim 30, as well as claims 31-33 depending therefrom are patentable.

Applicant's representative respectfully submits that the Office Action has failed to establish a *prima facie* case of obviousness with respect to claim 34. In rejecting claim 34, the Office Action relies on the same rationale that was relied on in the rejection of claim 1 (See Office Action, Page 9). However, Applicant's representative respectfully submits that claim 34 has a different scope than claim 1. Specifically, claim 34 recites updating ownership state information for a block of data at a plurality of owner predictors associated with respective processors, which is not recited in claim 1. Thus, the rationale provided for the rejection of claim 1 is insufficient to establish a *prima facie* case of obviousness with respect to claim 34. Accordingly, claim 34, as well as claims 35-38 depending therefrom are patentable.

In view of the foregoing, claims 1-8, 10-14, 17-23, and 26-41 are patentable. Thus, withdrawal of this rejection is respectfully requested.

**III. Allowable Subject Matter**

The Office Action Summary properly indicates that claims 16 and 24 are allowable, whereas the detailed section, at page 10, indicates that claims 16 and 24 are objected to as being dependent upon a rejected base claim. Applicant's representative respectfully submits that the objection to claims 16 and 24 was made in error because claims 16 and 24 are both independent claims. Thus, an indication of allowance of claims 16 and 24 is respectfully requested.

**IV. CONCLUSION**

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on January 14, 2010.

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